This listing of claims presented below replaces all prior versions and listings of claims in the application.

Listing of Claims

IN THE CLAIMS

1. (Previously Presented) A process for the production of metallic nanoparticles by controlled electro-explosion of a metallic wire in a suitable medium comprising:

(i) applying a voltage of greater than 12V to a first electrode and a second electrode, both said first and said second electrodes being formed of the metal whose nanoparticles are desired, said first electrode being in the form of a plate, and said second electrode being in the form of a wire, so as to achieve a spark between the first and second electrodes, thereby simulating a situation where the second electrode cross-section is pinched or reduced and whereby high current densities are achieved along the length of the second electrode,

(ii) instantaneously exploding both said first and second electrodes by sending shock waves through the bulk of the material, thereby melting the electrodes and dispersing them to form nanoparticles of the metal, and

(iii) collecting the fragments in a suitable medium and recovering the nanoparticles therefrom.

2. (Previously Presented) The process as claimed in claim 1, wherein the nanoparticles formed in step (ii) above are collected in said medium in order to form a protective capping layer around each nanoparticle so as to prevent the nanoparticle from coalescing into large particles.

3. (Previously Presented) The process as claimed in claim 2, wherein capping efficiency is determined by the combination of the metal and the medium in which the metal electrodes are exploded and the nanoparticle size is modified by altering one or more of the applied voltage, explosion current density and wire diameters.

4. (Previously Presented) The process as claimed in claim 1, wherein the second electrode makes contact with the said first electrode in a straight line and intermittently.

5. (Previously Presented) The process as claimed in claim 1, wherein the potential difference applied to both the said first and second electrodes is in the range of 12V - 48V DC.

6. (Previously Presented) The process as claimed in claim 1, wherein the cross-section of the second electrode is in the range of 0.4411 $x10^{-5}$ cm^2 - 1. 7721 $x10^{-5}$ cm^2 in order to carry current in the range of 0.96 $x10^6$ A/m^2 - 77. 6 x 10^6 A/m2.

7. (Previously Presented) The process as claimed in claim 1, wherein the metal used for forming the electrode has at least a conductivity of 3.5 x 10^7 $(ohm.m)^{-1}$.

8. (Previously Presented) The process as claimed in claim 1, wherein the metal is selected from the group consisting of transition metals, noble metals and Group III metals.

9. (Previously Presented) The process as claimed in claim l, wherein said metal is selected from the group consisting of Fe, Cu, Ag, and Al.

10. (Previously Presented) The process as claimed in claim 1, wherein the medium is selected from water and butanol.

11. (Cancelled)

12. (Withdrawn) An apparatus for the production of metallic nanoparticles by the controlled electro-explosion of a metallic wire in a suitable medium which comprises a reaction vessel containing said medium, a first and second electrodes mounted inside said vessel, submerged in said medium, said first and second electrodes being formed of a metal whose nanoparticles are desired, said first electrode being in the form of a plate, and said second electrode being in the form of a wire, so as to achieve a spark between the first and

second electrodes, thereby simulating a situation where the second electrode cross-section is pinched or reduced and whereby high current densities are achieved along the length of the second electrode, said electrodes being connected to a power source so that current is passed through said electrodes, instantaneously exploding both said first and second electrodes by sending shock waves through the bulk of the material, thereby melting the electrodes and dispersing them to form said nanoparticles of said metal.

13. (Withdrawn) The apparatus as claimed in claim 12, wherein said first electrode is mounted perpendicular to the base of said reactor.

14. (Withdrawn) The apparatus as claimed in claim 12, wherein said first electrode is mounted in said reaction vessel through stainless steel slides on an insulating block.

15. (Withdrawn) The apparatus as claimed in claim 14, wherein said insulating block is a plastic block.

16. (Withdrawn) The apparatus as claimed in claim 12, wherein said second electrode is mounted in said reaction vessel through a guide.

17. (Withdrawn) The apparatus as claimed in claim 16, wherein said guide comprises an "L" shaped glass tube, mounted through an insulating mounting means fixed in said reaction vessel.

18. (Withdrawn) The apparatus as claimed in claim 17, wherein said "L" shaped glass tube is mounted on said insulating mounted means such that it collimates said second electrode, passing therethrough to strike said first electrode along its normal.

19. (Withdrawn) The apparatus as claimed in claim 12, wherein said power source is a 12 to 48V battery.

20. (Cancelled)

21. (Previously presented) The process as claimed in claim 5, wherein the potential difference applied to both the first and second electrodes is 36 V DC.